

### REMARKS

By this Amendment, claims 7, 14 and 15 are amended and claim 18 is canceled without prejudice or disclaimer to the subject matter therein. Claim 19 is added herein. No new matter has been added. After entry of this Amendment, claims 1-17 and 19 will remain pending in the patent application. Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

In the Office Action, claims 7 and 14 were objected to. In response, claims 7 and 14 have been amended to capitalize each letter of the trademark/noun “Zerodur” and to include the proper trademark symbol. (*See* MPEP 608.01(v)). It is respectfully submitted that the amendment to claims 7 and 14 obviates the objection. Accordingly, reconsideration and withdrawal of the objection to claims 7 and 14 are respectfully requested.

Claims 15-18 were rejected under 35 U.S.C. §102(b) based on Moriyama *et al.* (U.S. Pat. No. 4,798,470) (hereinafter “Moriyama”). The rejection is respectfully traversed.

Claim 18 has been canceled without prejudice or disclaimer, thus rendering moot the rejection of claim 18.

Claim 15 is patentable over Moriyama at least because this claim recites a device manufacturing method wherein, *inter alia*, said substrate table includes an optical system that comprises optics arranged to form an image in a plane which is substantially perpendicular to an optical axis of said alignment system, said image being located outside of a perimeter of said substrate. Moriyama does not teach or suggest a method including this feature. Therefore, Moriyama does not teach or suggest each and every feature recited by claim 15 and, as a result, cannot anticipate this claim.

Moriyama discloses a projection system for printing a pattern on a wafer 101 which is fixed on a plate 111. (*See* FIG. 8). Moriyama discloses that the wafer 101 is provided with a plurality of minute through-holes 121 which are located at positions where alignment marks 103 are provided. (*See* col. 4, line 68 and col. 5, lines 1-3). Moriyama merely discloses that the projected image 126 of the target mark 115 is formed in the same plane of the through-hole 121 as the surface of the wafer 101, and that the projected image 126 and the target mark 103 are detected by the mark detectors 124 and 125. (*See* col. 5, lines 38-49, FIGS. 2, 5, 7, 9, and 10). However, Moriyama is completely silent about forming an image outside of the perimeter of the substrate. Furthermore, referring to FIGS. 7 and 10 of Moriyama, target marks 103 are not provided on the backside of the wafer, *i.e.* the side of the wafer that is

supported by the plate 111. Rather, these target marks 103 are merely located on the bottom of a hole that is formed on the backside of the wafer. (*See also* col. 5, lines 23-29).

Claims 16-17 are patentable over Moriyama at least by virtue of their dependency from claim 15 and for the additional features recited therein. Accordingly, reconsideration and withdrawal of the rejection of claims 15-18 under 35 U.S.C. §102(b) based on Moriyama are respectfully requested.

Claims 1-4, 8-11, and 15-17 were rejected under 35 U.S.C. §102(e) based on Sogard *et al.* (hereinafter "Sogard") (U.S. Pat. No. 6,376,329). The rejection is respectfully traversed.

Claim 1 is patentable over Sogard at least because this claim recites a device manufacturing method comprising, *inter alia*, coupling light from said at least one alignment marker on said second surface of said substrate to a location adjacent an edge of said substrate, with at least one optical system arranged in said substrate table; and aligning said substrate using said at least one alignment marker on said second surface of said substrate and an alignment system optically coupled to said at least one optical system. Sogard fails to teach or suggest a method including these features. Therefore, Sogard fails to teach or suggest each and every feature recited by claim 1 and, as a result, cannot anticipate claim 1.

Sogard discloses a projection apparatus for projecting a pattern on the wafer 30. Sogard discloses that the wafer is supported by a chuck 50 that is mounted to a stage 54. Sogard further discloses that through-bores 58 and 60 allow access to the alignment marks from backside of the wafer. (*See* col. 5, lines 35-44, and FIGS. 2A, 4 and 5A). However, Sogard fails to teach or suggest that light from the alignment marker is coupled to a location adjacent an edge of the substrate with an optical system arranged in the substrate table. Applicants note that the Examiner has failed to identify which element in Sogard corresponds to such optical system. Furthermore, Sogard is completely silent about an alignment system optically coupled to the at least one optical system. For at least these reasons, claim 1 is patentable over Sogard. Claims 2-4 are patentable over Sogard at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 8 is patentable over Sogard at least because this claim recites a device manufacturing method comprising, *inter alia*, coupling light from said at least one alignment marker on said second surface of said substrate, through said substrate table, with at least one optical system in said substrate table; directing said light upwards in a direction parallel to an optical axis of a projection system of said lithographic projection apparatus; and aligning said substrate using an alignment system optically coupled to said upwardly directed light.

Sogard fails to teach or suggest a method including these features. Therefore, Sogard fails to teach or suggest each and every feature recited by claim 8 and, as a result, cannot anticipate claim 8.

As mentioned previously, Sogard fails to teach or suggest coupling light from said at least one alignment marker on said second surface of said substrate, through said substrate table, with at least one optical system in said substrate table. Furthermore, Sogard is completely silent about directing light from the marker in an upward direction. Sogard merely disclose in FIG. 1 that light that is output by lasers 12 and 12' illuminates the alignment marks 22 and 22', and that light from these markers is then directed to the alignment detection system 16. However, that light is directed in a downward direction. In addition, Sogard makes no mention of an alignment system optically coupled to the upwardly directed light. For at least these reasons, claim 8 is patentable over Sogard. Claim 9-11 are patentable over Sogard at least by virtue of their dependency from claim 8 and for the additional features recited therein.

Claim 15 is patentable over Sogard at least because this claim recites a device manufacturing method wherein, *inter alia*, said substrate table includes an optical system that comprises optics arranged to form an image in a plane which is substantially perpendicular to an optical axis of said alignment system, said image being located outside of a perimeter of said substrate. Sogard does not teach or suggest a method including this feature. Therefore, Sogard does not teach or suggest each and every feature recited by claim 15 and, as a result, cannot anticipate this claim.

As mentioned previously, Sogard fails to teach or suggest forming an image located outside of a perimeter of the substrate with an optical system arranged in the substrate table. Therefore, claim 15 is allowable over Sogard. Claims 16 and 17 are patentable over Sogard at least by virtue of their dependency from claim 15 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-4, 8-11, and 15-17 under 35 U.S.C. 102(e) based on Sogard are respectfully requested.

Claims 6, 7, 13 and 14 were rejected under 35 U.S.C. §103(a) based on Sogard in view of van Empel *et al.* (hereinafter "van Empel") (U.S. Pat. No. 6,413,701). The rejection is respectfully traversed.

Claims 6 and 7 depend from claim 1 and are therefore patentable over Sogard for at least the same reasons provided above in connection to claim 1. Van Empel fails to remedy the deficiencies of Sogard. Namely, van Empel fails to teach or suggest coupling light from

said at least one alignment marker on said second surface of said substrate to a location adjacent an edge of said substrate, with at least one optical system arranged in said substrate table; and aligning said substrate using said at least one alignment marker on said second surface of said substrate and an alignment system optically coupled to said at least one optical system. Therefore, any reasonable combination of Sogard and van Empel cannot result in any way in the invention of claims 6 and 7.

Similarly, claims 13 and 14 depend from claim 8 and are therefore patentable over Sogard for at least the same reasons provided above in connection to claim 8. Van Empel fails to remedy the deficiencies of Sogard. That is, van Empel fails to teach or suggest coupling light from said at least one alignment marker on said second surface of said substrate, through said substrate table, with at least one optical system in said substrate table; directing said light upwards in a direction parallel to an optical axis of a projection system of said lithographic projection apparatus; and aligning said substrate using an alignment system optically coupled to said upwardly directed light. Sogard fails to teach or suggest a method including these features. Therefore, any reasonable combination of Sogard and van Empel cannot result in any way in the invention of claims 13 and 14.

Accordingly, reconsideration and withdrawal of the rejection of claims 6-7 and 13-14 under 35 U.S.C. §103(a) based on Sogard in view of van Empel are respectfully requested.

New claim 19 depends from claim 5 and is patentable for at least the same reasons, as well as for the additional recitation therein.

Applicants have addressed all the Examiner's rejections and objection and respectfully submit that the application is in condition for allowance. A notice to that effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

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Respectfully submitted,

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